

PROJECT NUMBER: 2107
PROJECT TITLE: Filter Research & Development
PROJECT LEADER: C. J. Campbell
PERIOD COVERED: October, 1988

I. FILTER RESEARCH & DEVELOPMENT GROUP:

- A. **Objective:** Consolidate efforts on filter research and development into one group and actively pursue the development of improved filter systems.
- B. **Status:** Concentric filters which selectively filter either core smoke or peripheral smoke are being investigated to determine whether they have a subjective advantage over conventional filters. Filtrona is producing six models of concentric filters, three core flow and three peripheral flow, for evaluation on a Merit Ultra Lights type cigarette. These will be subjectively compared to a control MUL at the same tar delivery.

A computer model of the concentric filter has been developed and is being used in design cigarette. Two Marlboro Lights type cigarettes with peripheral flow concentric filters were constructed and evaluated analytically. The information obtained will be used to improve the computer model.

A Sun work station has been installed in our lab and will allow improved access to cigarette performance modeling.

Communications with FTR are being maintained on projects of mutual interest such as concentric filters and CA web.

II. FILTER SUPPORT FOR MAJOR PROGRAMS:

- A. **Objective:** Provide design assistance and potential new filter systems for major R&D programs.
- B. **Status:** Four filter samples have been attached to rods containing two different blends of ART filler and are being subjectively evaluated by the Flavor Panel. These consist of a core flow concentric filter, a peripheral flow concentric filter, a filter with potassium carbonate additive, and a filter with dipotassium phosphate additive. Additional ART blends, filters, and menthol samples will be evaluated.

New formulations of PVA Menthol which use Benzoflex plasticizer and result in a lower alcohol content have been mixed and are being tested for menthol retention. An attempt is also being made to increase the menthol content per unit volume to simplify application.

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III. CELLULOSE ACETATE WEB:

- A. Objective: Explore the potential advantages of CA web for use as a high efficiency filter material.
- B. Status: Celanese has now received the CA web material from Dexter and is in the process of making filter rods for our evaluation.
- C. Plans: Evaluate samples for efficiency and subjectives.

IV. IMPROVED MENTHOL STABILITY:

- A. Objective: Investigate methods of improving the stability of menthol delivery in smoke of aged cigarettes.
- B. Status: An aging study of menthol cigarettes made from Filtrona heat set filter rods is continuing into week five. Menthol content of the filter and delivery of menthol in smoke is being compared with a control cigarette to test the ability of the heat set filter to resist menthol absorption during aging.

Two models of Marlboro Lights Menthol cigarettes with PVA menthol and a control which has a standard filter and mentholated foil were made and evaluated. Analytical results showed that one of the PVA models was low on menthol delivery. Subjective evaluation by a Flavor Panel indicated a definite preference for the mentholated foil model. A second subjective evaluation by an OC or MC panel is planned.

V. TOW VENDOR R&D COORDINATION:

- A. Objective: Coordinate specific requests for R&D work by Eastman and Celanese.
- B. Status: Eastman 1.6 dpf filters and Filtrona UHF filters are on hand awaiting cigarette fabrication by Semiworks. These may allow the construction of ultra low delivery cigarettes with reduced ventilation. A more comprehensive test is being planned to include subjective evaluation.

An annual review of Celanese R&D efforts has been scheduled for December 7.

VI. FILTER ADDITIVES:

- A. Objective:** Investigate the effects of filter additives for analytical and subjective benefits.
- B. Status:** Six models of GCC Marlboro cigarettes made with filters containing various additives were made in the Semiworks and have been analytically tested. Filters made with citric acid added and those with lactic acid added (by Celanese) showed a good reduction (15%) in nicotine/tar ratio. These additives present a problem in application, however, requiring a separate application booth on the plugmaker. Another additive, diethyl citrate, also showed a reasonable reduction (12%) in nicotine/tar ratio, but it can be applied along with triacetin. Filter firmness and subjectives are now being evaluated.

Additional screening of FML filters with hand applied additives has shown that significant modification of subjectives is possible. Samples of these additives are on hand and machine made plugs with consistently applied additives have been requested from the FML group for subjective evaluation.

- C. Plans:** Produce FML filters with additives and evaluate.